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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/691,049

10/23/2003

William J. Brinkley III

027186-000110US

6094

20350 7590 09/11/2008

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EXAMINER

HANDAL, KAITLY V

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

09/11/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/691,049		Applicant(s) BRINKLEY, WILLIAM J.	
	Examiner KAITY V. HANDAL		Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 16 May 2008.

2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 21-28, 30-36 and 38-40 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 21-28, 30-36 and 38-40 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some * c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 21-23, 25-28, 30-33, 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gallagher (US 3,895,102) in view of Molter et al (US 4,818,637).

With respect to claims 21 and 25-26, 30, 32-33, Gallagher teaches a method for generating hydrogen gas comprising of:

- transferring hydroxide solution (25% potassium hydroxide solution (col. 4, lines 25-28) at approximately 180 degrees Fahrenheit (col. 4, lines 24-28) into a gas generating tank (22) (col. 11, lines 22-32), wherein the gas generating tank (22) contains aluminum (col. 11, lines 50-51) and wherein the transferred hydroxide solution completely covers the aluminum (as illustrated in Fig. 1);

- reacting the transferred hydroxide solution with the aluminum to generate hydrogen gas (col. 11, lines 53-62);

- transferring the hydroxide solution out of the gas generating tank via drain outlet (34) to stop the reaction (col. 11, lines 62-col. 12, lines 13-14);

- collecting the hydrogen gas and delivering it to an application/fuel cell (col. 1, lines 32-36).

Gallagher fails to teach wherein his hydrogen generation method comprises the step of humidifying the generated hydrogen gas by passing it through a water tank. Molter et al. teaches an improved method for operating a conventional solid polymer electrolyte membrane hydrogen/halogen fuel cell. The improvement comprises humidifying the hydrogen gas, wherein the humidity of the humidified hydrogen gas is approximately 100% (col. 3, lines 47-58 and col. 4, lines 41-44), by passing it through a separate water tank (as illustrated in Figure 2) prior to it entering the anode chamber thereby providing additional water to be protonically pumped through the membrane to the cathode where it dilutes the acid produced by the cathodic reaction (abstract).

It would have been obvious to one having ordinary skill in the art at the time of the invention to humidify said hydrogen gas from said generating tank of Gallagher by passing it through a separate water tank before feeding it to said fuel cell, as taught by Molter et al., for the purpose of improving operation of the fuel cell.

With respect to claims 22-23 and 27, Gallagher teaches wherein his method further comprises preheating (preheating of said solution is understood - see (col. 10, lines 22-25) the hydroxide solution at approximately 180 degrees Fahrenheit (col. 4, lines 24-28); pressurizing the liquid holding tank; and transferring the hydroxide solution under pressure (pressurized by air)/(hydrostatic liquid head pressure) into the gas generating tank (col. 11, lines 22-26) (as illustrated). Gallagher further teaches wherein pressurizing the gas generating tank containing the hydroxide solution at approximately 180 degrees Fahrenheit and transferring the

hydroxide solution under pressure out of the gas generating tank (col. 11, lines 22-26 and col. 11, lines 63 - col. 12, lines 13-14).

With respect to claim 28, Gallagher as modified does not disclose a specific reactor size, however, change in size and shape is not patently distinct over the prior art absent persuasive evidence that the particular configuration of the claimed invention is significant. See *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). MPEP 2144.04 IV A.(size) MPEP 2144.04 IV B (Shape).

With respect to claim 31, Gallagher further teaches wherein the application is an engine for powering it (col. 1, lines 15-30).

Limitations recited in claim 38 are mere duplication of parts: *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960) It has been held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced). MPEP 2144.06B.

3. Claims 24, 39-40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gallagher (US 3,895,102) in view of Molter et al (US 4,818,637), as applied to claim 21 above, and further in view of Von Strum (US 3,574,560) in view of Richman (US 3,669,751).

With respect to claims 24 and 39-40, Gallagher teaches the formation of cement-like material on the exterior of the porous fuel rod/wafer during the reaction (col. 12,

lines 21-46), however he does not explicitly teach collecting waste/sediment at the bottom of said generating tank. Von Strum teaches providing a reservoir (1) of hydroxide solution (2); providing a gas generating tank (8) in fluid flow communication with said reservoir (1) with a gas inlet (5) defined in its top; equipping said generating tank with a plurality of tubular, metallic fuel rods (C2/L25-30); transferring hydroxide solution into the gas generating tank from said holding tank in response to pressure to start a gas generating reaction in said generating tank (C2/L17-43); and collecting waste/sediment at the bottom of said generating tank (fig. 2, 15) (as illustrated where sediments are collected in sediment separator (19)) (col. 3, lines 11-17) in order to remove undissolved reaction products/sediments out of the reactor.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to collect the waste/cement-like reaction products in Gallagher's modified apparatus, as taught by Von Strum, in order to remove undissolved waste reaction products out of the reactor.

Gallagher as modified fails to teach in his method to periodically open said generating tank to replace said fuel tubes. Richman teaches a fuel cell hydrogen generator wherein said hydrogen generator is comprised of fuel tubes (fig. 1, 22) such that said generating tank is periodically opened to replace said fuel tubes (22) in order to recharge the battery and replace the spent fuel tubes (22) (col. 3, lines 6-11).

It would have been obvious to one having ordinary skill in the art at the time of

the invention to periodically open said generating tank to replace said fuel tubes in the Gallagher's modified apparatus, as taught by Richman, in order to recharge the battery and replace the spent fuel tubes wherein the hydroxide solution in the gas generating tank is emptied; and the reacted aluminum is collected as a dust or fine grained powder. Therefore, it would have been obvious to one skilled in the art that, part of the functions involved in replacing the spent fuel tubes would include emptying the hydroxide solution in the gas generating tank and collecting the reacted aluminum residue, and recycling said aluminum as needed.

4. Claims 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gallagher (US 3,895,102) in view of Molter et al (US 4,818,637), as applied to claim 31-32 above, and further in view of Knowlton et al. (US 2001/0013321 A1).

With respect to claims 34-36, Gallagher as modified fails to teach details downstream of delivering hydrogen to an application such as an engine, collecting the engine exhaust and condensing water from the exhaust and returning water from said collecting and condensing step to said reservoir. Knowlton teaches supplying fuel for a vehicle which includes delivering hydrogen to an engine (fig. 1, 2) (page 2, paragraph [0023], lines 1-4), collecting the engine exhaust and condensing water from the exhaust in water recovery device (5); and returning water from said collecting and condensing step to said reservoir (4) (as illustrated) in order to convert the water vapor in the exhaust back into water reclaiming 80% of the water supplied to the fuel conversion device for reuse in the process (page 3, paragraph [0026]).

It would have been obvious to one having ordinary skill in the art at the time of the invention to deliver hydrogen to an application such as an engine, collect the engine exhaust and condense water from the exhaust and return water from said collecting and condensing step to said water reservoir in the apparatus of Gallagher, as taught by Knowlton, in order to convert the water vapor in the exhaust back into water reclaiming 80% of the water supplied to the fuel conversion device for reuse in the process for reuse. Therefore, it would have been equally obvious to one having ordinary skill in the art at the time the invention was made to collect fuel cell exhaust and condense the water from the fuel cell exhaust for further use.

Regarding claims 35-36 claim language related to receiving the water from the condenser as drinking water is considered intended use language and does not further limit the claim.

Response to Arguments

Specification

Objection made to claim 3 is withdrawn by examiner due to applicant's amendment made to the claims.

Prior Art Rejection

Applicant's arguments filed 5/16/2008 have been fully considered but they are not persuasive.

On page 7 of the Remarks, last paragraph, applicant argues as follows:

"With the amendment to claim 21, the present invention is now limited to the reaction between aluminum metal and aqueous hydroxide, whereas the Gallagher disclosure is directed to the reaction between caustic and a silicon-containing metal, using ferrosilicon

as the silicon-containing metal. The various sub-reactions in the overall reaction of Gallagher are shown in column 1, lines 18- 20. Even though the reaction materials used by Gallagher include a wafer that contains aluminum, the main reactant in the wafer is the ferrosilicon and this is indeed the subject and focus of the Gallagher disclosure.... There is no suggestion from Gallagher of how to conduct a reaction between aluminum metal and hydroxide ion without the additional presence of a silicon-containing metal."

Examiner respectfully disagrees. Gallagher does suggest that metal particles other than silicon can be used, such as aluminum and aluminum alloys, thereby retarding the formation of a cement-like material (col. 12, lines 21-46). As far as amending the claims to limit the reaction between aluminum metal and aqueous hydroxide, examiner respectfully points out that the preamble of the claim includes "comprising" language which is open transitional language and does not exclude a reference from having more elements than those recited in the instant claims.

MPEP 2111.03 [R-3].

On page 8 of the Remarks, 2nd paragraph, applicant argues:

"...In reference to the temperature claimed by Applicant, the examiner has pointed to column 4, line 24-28 of Gallagher. The maximum temperature disclosed in that section is 80°C, which is equivalent to 176°F. This is below Applicant's claimed temperature of 180°, and even though Applicant's claim language recites this temperature as "approximately 180 degrees Fahrenheit," the disclosure does not suggest performing the reaction between aluminum metal and hydroxide ion at this temperature, since the Gallagher temperature range refers to a different reaction, i.e., the reaction between a silicon-containing metal and hydroxide ion..."

Examiner respectfully disagrees. The temperature as claimed, as set forth above by the applicant, is approximate to 180°F, therefore the temperature of Gallagher reads on the instantly claimed temperature. Examiner respectfully disagrees that the reactions are different. As set forth above that Gallagher does teach that metal particles other than silicon can be used, such as aluminum and aluminum alloys, thereby retarding the formation of a cement-like material (col. 12, lines 21-46).

As far as the remaining arguments pertaining to the dependent claims, examiner respectfully disagrees with all of them. Molter was not used to teach what Gallagher is

teaching, Molter was used to teach the missing feature in Gallagher, namely, humidifying hydrogen. Similarly, Richman, was used to teach the method of periodically opening the tank to replace the fuel tubes irrespective of the exact reactants and operating conditions of Richman. The common feature between the Gallagher & MolVon Strum and Richman is that they all contact a solution with fuel rod(s) to generate hydrogen, and Richman teaches the missing feature in the method of modified Gallagher as modified by Von Strum which involved opening the reaction tank and replacing the fuel rods periodically, I would imagine it to be an intuitive function by one having average skill in the art. Finally, Knowlton et al. was consulted with as prior art in order to teach the missing feature in modified Gallagher pertaining to details downstream of delivering hydrogen to an application in general irrespective of how hydrogen was generated.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAITY V. HANDAL whose telephone number is (571)272-8520. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. V. H./
Examiner, Art Unit 1795

8/29/08

/Alexa D. Neckel/
Supervisory Patent Examiner, Art Unit 1795

Search Notes

Application/Control No.

10/691,049

Examiner

KAITY V. HANDAL

Applicant(s)/Patent under
Reexamination

BRINKLEY, WILLIAM J.

Art Unit

1795

SEARCHED

Class	Subclass	Date	Examiner
Updated	Search	8/28/2008	KH

INTERFERENCE SEARCHED

Class	Subclass	Date	Examiner

**SEARCH NOTES
(INCLUDING SEARCH STRATEGY)**

	DATE	EXMR
Updated Key Word Search in EAST	8/28/2008	KH
Updated Inventorship Search	8/28/2008	KH